

THE ZOOLOGIST

No. 736.—October, 1902.

NOTES FROM SOME ZOOLOGICAL GARDENS OF WESTERN EUROPE.

BY GRAHAM RENSHAW, M.B.

PLATE II.

THE nineteenth century may be regretfully considered, from a zoological standpoint, as an era of extermination, a host of fine species having been recklessly blotted out by man since the year 1800. To instance only a few of these vanished forms, one may mention the Black Emu, the Reunion Starling, the Philip Island Parrot, the Labrador Duck, and the Great Auk. The disappearance of these species alone is a great loss to zoology; yet one might easily multiply examples indicating only too plainly the inexcusable havoc which has been caused amongst the lower animals during the last hundred years.

Brighter prospects, however, seem to be dawning with the twentieth century. The more active measures taken to enforce the due protection of the African great game animals during the last decade appear already to have achieved considerable success; whilst in other parts of the world the efforts of enlightened Governments have been able to arrest the diminution of threatened species, if one may rely upon the latest information concerning the European Bison, the American Bison, and the Scandinavian Elk. Moreover, the gun appears to be gradually being abandoned in favour of field-glass and camera, the observation of animals in their own haunts being now more

popular than ever; whilst the recent publication of various excellent works illustrated with photographs of living creatures under natural conditions will tend greatly to increase the number of those who take greater pleasure in watching the habits of living mammal and bird, reptile and fish, than in examining mere museum specimens of the same animals.

The various splendid zoological gardens of Europe have for many years contained a considerable amount of material for study; yet such material seems after all to have hardly received the attention that it has deserved. These institutions should not be regarded merely as resorts for crowds of curious sight-seers, but rather as extensive and very valuable biological laboratories where the fascinating science of zoology may be studied by means of note-book and camera rather than by the academic aid of microscope and scalpel. If fed on suitable food, and allotted abundant room for exercise, captive animals will afford much instruction to any naturalist who will study them systematically; and, although results may be somewhat vitiated by the absence of the proper surroundings of the species under observation, at any rate this method is extremely convenient for the naturalist himself, especially if he have no leisure for foreign travel. It is hoped that the following notes I have made on various inmates of continental menageries during the last four years will not only be interesting, but also contain much that is new. The animals now to be considered are as follows:—

CARNIVORA.

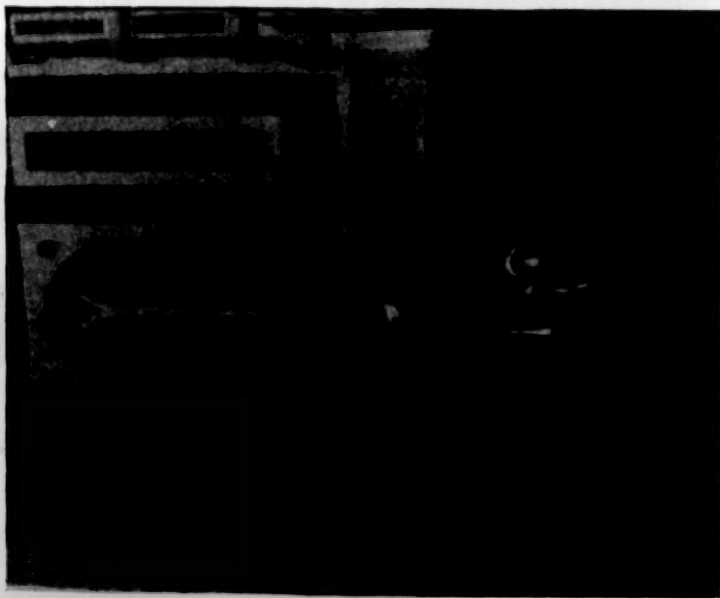
Canis jubatus (Maned Wolf).—An example of this very rare beast has been living for several years in the Amsterdam Zoological Gardens, its long ears and spidery legs constituting it one of the most striking exhibits in the menagerie. In walking the Maned Wolf carries its head almost on a level with its shoulders, and much lower than would have been supposed from an examination of museum specimens, which are probably mounted by taxidermists unfamiliar with the appearance of the living animal. The gait of the Maned Wolf is not at all clumsy, but quite the reverse, in spite of the long legs, the animal stalking about its cage like a shadow, and moving with considerable gracefulness; on account, however, of the great





AUGUST.

Seasonal Changes of *Addax nasomaculatus*.



MAY.



elongation of the fore leg below the knee the front part of the animal seems to be supported on stilts. When standing still the Maned Wolf draws its head well up, and then presents a very striking appearance.

UNGULATA.

Taurotragus oryx (Eland).—Ever since Lord Derby obtained his specimens of this fine Antelope for the Knowsley menagerie in 1842, Eland have been more or less familiar even to untravelled people, and most zoological gardens have from time to time possessed a pair or more of them. The Striped or Livingstone's Eland is still to be obtained, but the rapidly increasing rarity of the old unstriped form of the Cape lends a melancholy interest to the contemplation of the few examples now in captivity. I remember spending some time, in the late summer of 1900, in studying the herd of Unstriped Eland then still surviving at the Jardin d'Acclimatation in Paris. It was not encouraging as regards the perpetuation of the race to observe that in the herd of five there were three animals whose bent or otherwise malformed horns indicated but too surely the need for the fresh blood so difficult to obtain. Unstriped Eland tend to darken with age, and bulls may become quite black along the spine. Young bulls sometimes grow horns having an antero-posterior curvature, plainly evident when seen from the side, the concavity of the curve being anterior. One young adult I saw recently in a continental collection had the horns somewhat unequal, and curiously bent outwards at the tips, as if indicating an approach to the open spiral horns of the Kudu, or the still more open spiral of the Addax.

Wild Eland are stated to smear their foreheads with their own urine. I recollect observing a fine bull of this species busily rubbing his frontal mat of hair upon a moist place in the paddock where he was confined, and energetically raking up the mud with his horns. Scarcely had he desisted than his offspring—a youngster only a few weeks old—came up, and imitated his example. Perhaps both were instinctively following some transmitted ancestral impulse, but, as both had been born in Europe, the reason for the act was not very obvious.

Addax nasomaculatus (Addax). (Plate II.)—This interesting

Antelope is thickly clothed in winter on neck, shoulders, and the body as far as the hind quarters with a dense covering of coarse dun-coloured hair, which falls out in summer, leaving the animal smooth-coated. Specimens in zoological gardens have this change of coat well marked in the month of May. As far as I have been able to observe, the hair falls out in irregular patches, commencing on each side of the spine, and spreading downwards from several centres, the greyish hue of the subjacent coat gradually appearing through the thinning *pélisse*. The heavy tuft of dark-brown hair covering the forehead is unaltered at all seasons, and traces of coarse hair likewise persist on the throat, chest, and sides. One of these Antelopes, in August, 1900, was of a general greyish white colour; frontal tuft brown, and vertex of head behind horns lighter brown; the throat-mane was also brown, and very scanty. Thus the coat of the animal in summer differs very markedly from its winter covering.

Hippotragus equinus (Roan Antelope).—Occasionally one has the opportunity of observing, as regards menagerie specimens, various occurrences which are frequently recorded of the animal in a wild state. Thus sportsmen have frequently pointed out that even large Antelopes like the Roan may, in spite of their size, be quite unrecognisable when standing in dense bush; and it has been most interesting to observe some confirmation of this as regards the Senegambian Roan Antelope, the most conspicuously marked of all the protean variations of *H. equinus*. One would reasonably suppose that an Antelope as large as a Horse, with black and white face, black legs, and chestnut body, would be seen easily enough under almost any conditions; yet a fine cow of this species at Antwerp, when standing in her paddock under some overhanging trees, was admirably concealed by her very coloration. The black of the face and legs harmonised completely with the shadows cast by the branches overhead, whilst the bright sunlight streaming through the interstices of the foliage merely revealed the chestnut-coloured body as a large surface of uniform colouring. Had this Antelope been standing amidst natural surroundings she would surely have escaped observation altogether.

Connochaetes taurinus (Brindled Gnu).—It may not be generally known that these extraordinary looking Antelopes—half

Buffalo, half Pony, as it were—often bear vestiges of their Hartebeest ancestry in the shape of more or less distinct annulations on the horns near the base, and most distinct on the posterior aspect. In a pair I recently examined the cow had five distinct rings on each horn, and very similar markings were recognisable on the bull. One character of these animals appears to have been hitherto overlooked in descriptions of their external appearance—the mane hangs over to the *right* side of the neck, whereas in several other Antelopes, such as the Beisa (*Oryx beisa*), this appendage inclines to the left. Brindled Gnu are fond of rubbing themselves against posts, and also delight in rolling in any moisture that may be found in their paddock. They are extremely inquisitive, and will frequently come up to investigate an object with determined and not very friendly curiosity. If two are kept together they will fight in a more or less determined manner, dropping on their knees to crash their heavily armed heads together. Females with young are very alert and suspicious; one Gnu, which I had permission to photograph, becoming somewhat alarmed at my proceedings (though at a distance of fully one hundred yards), gave the alarm by a peculiar braying snort. Immediately on hearing this the calf got up, and stood staring hard in the direction of the supposed danger.

Bubalis buselaphus (Bubaline Hartebeest). — The Bubaline Hartebeest does well in captivity, and under suitable conditions will breed as readily as Eland or Burchell Zebra. In 1900 there was quite a large herd at the Jardin des Plantes, Paris, numbering eight individuals, of which at least three had been born in the menagerie. The young were fawn-coloured like the parents, and had small horns in the form of short backwardly directed divergent spikes. The colour of the Bubaline Hartebeest appears well adapted to protect it in its desert home. I found that the outlines of a menagerie specimen standing on a sanded floor and against the woodwork of its enclosure began to be indistinct at a distance of twenty-four yards.

Giraffa camelopardalis (Northern Giraffe). — The history of the Giraffes brought to London in 1836 is probably familiar to many; most readers of 'The Zoologist' will recollect that the four animals then imported became the founders of a long line

of English-bred animals, which only terminated on the death of the last of them in 1894. One of the first of this series is figured in Sir Cornwallis Harris's work on the game of South Africa, so that those of us who remember the last survivors of this large family will realise that the London Giraffes constituted a link between the present day and the reign of William IV., since Harris set out on the shooting tour which eventually furnished material for his book as long ago as 1836. It may not perhaps be generally known that the Northern Giraffe has repeatedly bred in the Antwerp Zoological Gardens, births having occurred in 1871, 1873, 1875, 1876, and 1878. The last survivor of this fine series is still living, and carries her twenty-three years with the elasticity of youth. The young pair of Giraffes recently sent to Antwerp from the Soudan are much darker in coat than this European-bred female. The third horn of the eighteen-month-old male is about one inch long; the horns of the young female bear well-developed tufts of drooping hair not seen in either of the other two animals.

Equus zebra (Mountain Zebra).—The voice of this animal is a curious whistling metallic neigh. Young foals of this species are much rougher in coat than their parents, and the stripes are brownish rather than black; a Mountain Zebra foal in the Jardin des Plantes collection, at about ten months old, was still quite rough in coat. The stripes on the neck, mane, and legs were black, and those on the body were nearly all brown. The mother was very suspicious of all visitors, and continually endeavoured to interpose herself between her young one and any spectators, although the foal was already nearly as big as herself.

E. burchelli (Burchell's Zebra). — Most naturalists will be aware that the original type of this animal as described by Burchell had the legs unstriped, or at most with but few markings. The practical extermination of this form, however, has unfortunately now been compassed, so that almost all the Zebras of this species now in zoological gardens have the legs regularly banded, often right down to the hoofs. Occasionally, however, one meets with the rarer form, of which I have examined a specimen. As was seen from the rough coat, this animal was quite young. A remarkable point was that the animal stated to be its mother had

the legs regularly striped. An equine hybrid (Asiatic Wild Ass, ♂ × Burchell Zebra, ♀) now living in the Jardin des Plantes is rufous grey in colour, having the body and legs ornamented with long thin stripes, but the hind quarters boldly marked with broad dark bands like its mother.

Cervus davidianus (Père David's Deer).—Much interest attaches to this very rare animal, since probably it is now utterly exterminated in the wild state, those now in captivity—a scanty band indeed—being all that is left of the species. I recollect seeing several in the Jardin d'Acclimatation some years ago, but they are all gone now. An old male still survives in the Jardin des Plantes—a faded-looking specimen, and not at all attractive, save for his great rarity. When I saw him a few weeks ago he was standing still, with muzzle on ground, sleepy and lethargic, as if the fate of his race was beginning to personally oppress him. The note of this Deer is a disagreeable bray; in fact, *Cervus davidianus* cannot be considered a nice animal at all.

RODENTIA.

Cynomys ludovicianus (Prairie Dog).—These little rodents flourish abundantly in captivity if allowed plenty of room, frisking about in broad daylight like so many Ground Squirrels, and continually popping in and out of their burrows. Such individuals as I have been able to observe delved with tremendous energy and enthusiastic perseverance, the earth being rapidly thrown out between the straddled-out hind legs. As far as one could judge, the shape of the mounds thus thrown up by these Prairie Dogs was flatter and somewhat more elongated than that of the typical watch-tower structure usually figured in works of natural history. The Prairie Dog "town" in the Jardin d'Acclimatation consists of a number of somewhat widely separated burrows, and none of the mounds are very large; in fact, at a short distance they are hardly distinguishable from the surrounding earth. Prairie Dogs will breed readily in captivity, and make interesting pets.

VARIATIONS IN COLOURING OF *STERCORARIUS CREPIDATUS*.

BY EDMUND SELOUS.

THE Arctic Skua (*Stercorarius crepidatus*) is usually described as being dimorphous—that is to say, of two forms in regard to its plumage, one dark and the other light. I have lately, whilst in the Shetlands, written down the description of various birds as they stood on the heath, after carefully watching them through the glasses, at a very moderate distance. I might have added greatly to the list, hardly any two individuals being alike in the same degree that the individuals of most other birds are—at least this appeared to me to be the case. But my time for this was limited, and my list consists of fifteen birds only. It is as follows:—

(1) The neck from just below the head, with the throat, breast, and ventral surface as far as the legs, a beautiful creamy white. The rest dark, as in the ordinary cases; but I was not careful to note the precise shade. The crown of the head—and this, I think, is universal—sufficiently dark to appear black. This bird represents, I think, the extreme of the light form in which dark and light are almost equally divided.

(2) The light colouring extends, speaking roughly, over the same parts, but it is very much less bright and pure. It might be described as a dun-cream or cream-dun, the two shades seeming to struggle for supremacy. The cream prevails on the neck, the dun on the other parts; but even the neck is of a much duller shade than in the bird just described (No. 1). There are parts of the breast where the original sombre hue, a little softened, encroaches cloudily upon the lighter surface. These two birds cannot—I say this after due comparison—be described as more or less handsome in the same colouring. The lighter surface, at any rate, is plainly different in shade, as also its amount and distribution, though in a less degree.

(3) Another bird is much like this last one (No. 2), but there is, here, a distinct broad dunnish space dividing the throat and breast parts.

(4) Another bird—one of two standing together—is the common form (that is, dark), except that the neck and throat just below the head for about an inch is very much lighter, making a considerable approach to cream, without quite obtaining it. This light part is conspicuous in the one bird, but not in the other (No. 5) it is standing by.

(5) This other one might pass for the ordinary dark form, but on examining it through the glasses a lighter, though less salient, collar is distinctly visible.

(6) In a third bird, not far off these two (Nos. 4 and 5), the whole colouring from immediately below the forehead and crown of the head, which seems always to be black (or very dark), is of a uniform brown-drab or brown-dun colour, there being not the slightest approach to a lighter collar, or any lightness elsewhere, except that which—as in all the birds—becomes visible on the quill-feathers of the wings in flight.

(7) In another bird the breast and ventral surface is of a delicate silvery cream or creamy silver, something like that of the Great Crested Grebe. On the sides of the neck and just below the chin it is the same—perhaps a little less silvered; but between these two spaces—and so between the chin and breast—a zone of faint brown or dun, somewhat broken and cloudy, pushes itself forward from the wings, thus breaking the continuity of the light surface by the strengthening of a tendency which is, perhaps, just traceable even in the lightest specimens. Besides this a similar clouded space is continued downwards from the back of the head, first in a diminishing quantity, and then again broadening out till it joins the upper body-colour. So that here only a little of the nape is white, hardly more than what may be described as the two sides of the neck. This is a very pretty and delicate combination.

(8) Close beside this last bird (No. 7) is a uniformly dark brown one; and

(9), not far on the other side of it, one which exhibits the same sort of general effect, in a dark smoky dun. This latter bird would generally pass as representing the dark form, and,

with fluctuations in either direction, dark or light, it does represent the common form. Nevertheless, it is both light and varied compared with the extreme or uniform dark brown form beside it (No. 8), which appears to me to be the least common one of all, less so than the extreme light one (No. 1) at the other end. (N.B.—When I say uniform, I do not mean to include the crown of the head or tips of the wings, which are always darker than the rest of the plumage.)

(10) A bird that from the dark crown of the head to the dark tips of the wings is, above and below, a uniform dark brownish dun, yet some washes lighter than the uniform brown one (No. 8) that I have spoken of.

(11) A bird that from the dark crown to the dark wing-tips is, above and below, a uniform light fawnish dun.

(12) A bird that would be the extreme light form (No. 1) that I have first described, were it not that both on the throat and breast the cream is encroached upon by cloudy barrings of a soft greyish-brown, which extend also over the under surface of the wings. Moreover, a toning of the darker colour of the general upper surface encroaches a little upon the cream of the nape.

(13) A bird exhibiting the uniform dusky dunnish colour (a shade lighter, perhaps, on the under surface), but with a cream patch on each side of the neck just below the head. These patches are not, perhaps, of the brightest cream, but they are very conspicuous, whether the bird is seen standing or flying—in fact, the conspicuous feature.

(14) A bird that would be the extreme light form (No. 1), but for a distinct collar of soft brown dividing the cream of the neck and throat from that of the breast.

(15) A bird that is yellowish dun on the neck and throat, mottled brown on the breast, and a fine cream on the ventral surface.

Moreover, all these birds differed, to a greater or less extent, in those lighter markings of the quill-feathers, both on the upper and under surface, some being lighter and some darker, following in this respect the general colouring. This feature, however, is only apparent when the birds fly, and I found it too laborious to include.

So far as I can be sure—judging by the lance-like projecting

feathers of the tail, absent in the young bird, and by every other indication—all the individuals here described were old birds in mature plumage. They were all established in one locality, and I was able to compare most of them with each other. I think, therefore, that, though some of my colour-terms may not be quite accurate—in describing colours there is generally some difference of nomenclature—yet that the variation between the different forms is properly brought out. Without my seeking it, the list includes the two extreme forms, as I believe them to be, of dark and light—the former represented by a uniformly dark brown bird, the latter by one having the whole under surface of the body, as well as the sides and nape of the neck, of a beautiful cream colour, by virtue of which, and of the salient contrast exhibited between this and the dusky upper surface, it is extremely handsome, not to say beautiful—one of the handsomest of all our British birds, in my opinion. Both the extreme forms are uncommon, whilst of the many forms between them hardly any two seem to me to be quite alike. The extreme forms are, or much more so; and this would make them more numerous than any one of the others, though less so than all of these collectively. Also the extreme light, or handsome, form seems to me to be commoner than the extreme plain one. Should not a bird like this be described as multimorphous rather than as dimorphous? I believe that there exists as perfect a series between the two extreme forms as between the least eye-like and the most perfect eye-feather in the tail of the Peacock, as pointed out by Darwin, and exhibited in the Natural History Museum at South Kensington. The eye, however, insensibly masses the less saliently distinguished individuals together, so that those in whose plumage the light colouring is more *en évidence* than the dark go down as the light form, and *vice versâ*. Moreover, the more *prononcé* a bird is in one or another direction the more it is remarked; so that perhaps the intermediate shadings are forgotten, on the same principle as that by which extreme characters in any direction are more appreciated than less extreme ones by the breeders of fancy birds—pigeons, poultry, &c. The uniform brown form, however, as being less striking (though extreme at one end), is not, I believe, so much noticed as those various dunnish shades

which have, in my view, been classed all together as the dark variety. Still, with all this, I confess it is a puzzle to me how a bird, the individuals of which differ so greatly and indefinitely, can have come to be considered as merely exhibiting two forms of colouring.

As far as I remember, all the nestling birds which I have seen have been merely brown, without any admixture of cream under the fluff; but I have not seen very many. When older and able to fly, but still young, all that I have seen have had a colouring of their own—for their plumage has borne a considerable resemblance to that of the Great Skua (*Stercorarius catarrhactes*), being mottled on the back with two shades of brown, a darker and a lighter one. I got the effect of this when I watched young birds flying or standing, and one day I caught one whose wing had been injured, and saw that it was so. This resemblance is increased by such birds wanting the lance-like feathers (or feather) in the tail. This mottled brown is the only kind of colouring which I have seen in these immature but comparatively advanced birds. Certainly, compared to the old ones, there were but few of these to be seen on my late visit. Had there been only one, however, that exhibited the ordinary light or dark form of plumage, or any sensible approach towards it, I believe I should have noticed it, as I was for seventeen days on the spot. My impression is that in the still younger birds this mottling was either absent or not so noticeable. At any rate, I have no clear recollection of it.

My own explanation of all these facts is that *Stercorarius crepidatus*, having been originally a plain homely-coloured bird, like the Great Skua, is being gradually modified, under the influence of sexual selection, into a most beautiful one, as represented by the extreme light, or half-cream, form. Natural selection seems here excluded, or, at any rate, extremely doubtful; and, if it be proposed that the lighter (or darker) birds have the more vigorous constitutions, I can only say that I believe it would be extremely difficult to produce any kind of evidence in favour of the suggestion. Without evidence, such a view is a mere supposition, and therefore not worth while considering. The main facts suggest choice in a certain direction. There is a gradation of colour and pattern connecting two forms—one

plain, the other lovely. This suggests a passage from one to the other, and if the plain form most resembles the young bird in colouring (which is my own experience), whilst the young bird resembles, more than any old one, an allied plainer species, this seems to make it more than likely that the passage is from the plain to the lovely, and not from the lovely to the plain. Supporting and emphasizing this, we have the absence of those lance-like feathers in the tail of the young bird which give so marked a character to, and add so infinitely to the grace of, the old one. Of what use can this thin projection an inch or so beyond the serviceable fan of the tail be to the bird? Seeing how well every other bird does without it, can we suppose it to be of any service? Its beauty, however—which one misses dreadfully in the young flying bird—is apparent to anyone, and it goes hand in hand with an increased and ascending scale of beauty in colour. All this seems to me to point towards sexual selection, since I am personally a believer in the reality of that power, having never heard or read anything against it so convincing to my mind as what Darwin has said for it, nor seen anything that has appeared to me to be inconsistent either with his facts or his arguments.

SEA-BIRDS AND PLOVERS NOTICED IN LANCA-
SHIRE AND CUMBERLAND.

BY THOMAS HEPBURN.

THE primary object of this trip—Walney Island, June 1st-3rd; Ravenglass, June 4th-5th; Boot, June 6th-9th; and Arnside, June 10th-12th, 1901—was to make myself better acquainted by actual observation with the breeding habits of some of our sea-birds and Plovers. There are numerous colonies of Black-headed Gulls and Terns in the sand-hills and marshy parts of Walney Island, and in the same style of country on either side of the mouth of the Esk at Ravenglass. At Foulshaw Moss, near Arnside, there is a large colony of Lesser Black-backed Gulls; and the margins of the tidal estuaries at Ravenglass and Arnside, and the sea beaches at all three places, form suitable haunts for various Waders and shore-loving birds. I found, however, that I had timed my visit too late for the birds breeding in the hills round Boot.

RINGED PLOVER (*Ægialitis hiaticula*).—*Walney Island*. Pairs of this bird were fairly numerous along the stretches of shingle beach which form part of the coast-line of the island.

Ravenglass. I found a nest in the sand-hills here, not far from the sea, containing three eggs; a cockle-shell, $1\frac{1}{2}$ in. diameter, apparently taking the place of the fourth egg. The nest was a careless hollow scratched out of the sand, $5\frac{1}{2}$ in. diameter by $1\frac{1}{2}$ in. deep, with a few pieces of broken shell in the bottom. A nest was also shown me, which was made close under the shelter of an overhanging sand-hummock, and from which the young had just been hatched. The nest-hollow was scraped out of the sloping side of the hummock, with its projecting top about a foot over the nest, completely covering it from the sky, while some coarse grass drooping over partly concealed it in front. I could see the footprints of the young birds going away from the edge of the nest, and picked up

a piece of a Ringed Plover's egg-shell within five yards of it. The fisherman who showed it to me said that it had only contained three eggs.

GOLDEN PLOVER (*Charadrius pluvialis*).—I saw a single bird of this species on the hills near Boot.

LAPWING (*Vanellus vulgaris*).—There were scattered pairs of these birds all over Walney Island; also at Ravenglass, and on the hills round Boot. At Arnside there were several fair-sized flocks feeding on the sands, as well as breeding pairs.

OYSTERCATCHER (*Hæmatopus ostralegus*).—*Walney Island.* I examined four nests of this species on Walney Island, where the birds were fairly common. Two of these nests were on patches of shingle, one being a little way above high-water mark, and the other in the centre of the sand-hills (amongst which there are a good many flat stretches covered with shingle). They were shallow hollows scratched out amongst the stones, with a few pieces of broken shell round the rims. They both contained three eggs. The hollows measured about 7 in. in diameter and $1\frac{1}{2}$ in. deep. Of the other two nests, one was on a hillock covered with short turf, and the hollow, which measured 7 in. diameter by 2 in. deep, was thickly lined with bits of dead thistle-stems, and contained two eggs; the second was a shallow depression amongst some heather, 4 in. diameter by 1 in. deep, and also contained two eggs. One of these clutches of two eggs I blew, and found to be very hard-set; they must therefore have been the full complement of eggs in that case. In another case of one clutch of three I found one egg quite fresh, one with a distinct chicken formed in it, and one in a condition midway between the two; this would lead one to suppose that the bird must have started sitting as soon as the first egg was laid. I found a nestling in one part of the beach; it was crouched down on the pebbles, with its head stretched straight out in front. The general colour of the down was almost black, with a few streaks and mottlings of brown. The bill was black, and the feet flesh-coloured. There were several large flocks of these birds round the coast of the island, and these I took to be non-breeders.

Ravenglass. The Oystercatcher was if anything even commoner at Ravenglass than on Walney Island. In an hour's walk among the sand-hills on the south side of the Esk I found no fewer

than four nests, one containing three eggs, two but two eggs, and the fourth only one egg. Three of these nests were hollows scratched in the sand (in two cases amongst the *débris* thrown up by the tide), with a few little pieces of broken shell scattered over the bottom of the hollow; the fourth nest was in a patch of shingle, and was carefully paved all over with small flat stones. These nests were all practically the same size, about 7 in. diameter by $1\frac{1}{2}$ in. deep.

Arnside. I saw one pair of Oystercatchers here, which had either young birds or eggs, near some marshy land along the estuary of the Kent.

COMMON SNIPE (*Gallinago caelestis*).—I put up a single bird of this species near Ravenglass in some marshy land; and I also saw the bird at Arnside.

COMMON SANDPIPER (*Totanus hypoleucus*).—*Boot.* There were a pair or two of these birds round the edges of most of the tarns in the hills. On the edge of Devoke Water I found an old bird with nestlings just able to run. The down of the young was a reddish sandy-brown colour, with sepia streaks and spots; the bill was black, and the feet and legs were a dull greyish flesh-colour. The old bird made a great fuss while I was looking at the young ones, coming within two or three yards of me, and uttering a loud piping note all the time.

Arnside. I found a nest of this species in some marshy ground near Foulshaw Moss. The bird sat very close, and only flew off when I was within a pace of the nest. It flew straight away, and did not come back either while I was examining the nest, or was in the vicinity of it. The nest was rather a deep hollow scratched out amongst a thick growth of sorrel and grass, which quite concealed the eggs when the bird flew off. It measured 4 in. diameter by 2 in. deep, was lined with a few pieces of dead grass, and contained four eggs.

REDSHANK (*T. calidris*).—I saw a few pairs of these birds at Ravenglass and at Arnside, where they had evidently been breeding; but there were no great numbers at either place.

COMMON CURLEW (*Numenius arquata*).—There were flocks of Curlews on the coast of Walney Island and at Ravenglass.

Boot. There were here several pairs of breeding birds about the hills. One pair which I watched for some time had

young which could fly quite well. The old birds flew round at a safe distance, very often settling on opposite side of me, keeping just out of sight over the rise of the hill, calling to each other with a soft musical whistle all the time. At another spot a pair were particularly noisy and bold, coming quite close to me, and whistling loudly. Several times I noticed one of these birds flying at a great height, apparently crossing from one hill-top to another, uttering a prolonged and varied whistle, which might almost be called a song.

Arnside. The keeper at Foulshaw Moss told me that when the Curlews flew around, as in the two instances mentioned above, and as a bird was doing while I was speaking to him, it was a sure sign that the eggs were hatched out, and that their young were somewhere near. When they had eggs, they were much quieter in their behaviour. There were three or four pairs breeding about Foulshaw Moss.

SANDWICH TERN (*Sterna cantiaea*).—The Sandwich Tern was breeding in the sand-hills at Ravenglass. It is said to breed also on Walney Island, but I was unable to find it there, although I searched carefully for it.

Ravenglass. I was told here by one of the fishermen that there were about fifty pairs of these Terns breeding in the sand-hills, in eight or nine separate clumps, amongst the large colony of Black-headed Gulls. During one afternoon I found four nests in one spot, and ten nests in another. They were placed very close together, the clump of four covering an area of about one square yard, and the ten nests covering a proportionately small area. In every nest the young were just coming out of the eggs, the clutch having been either three or two eggs. The down of the young was a light grey colour speckled with black. The nests were very slight hollows made in the loose sand, a few of them having a few pieces of dry grass arranged round the edge. The sand was so loose and dry that in many cases almost all trace of nest had disappeared; but where the shape of the nest could be made out, it measured about 5 in. diameter by $\frac{1}{2}$ in. deep. Both these clumps of nests were surrounded by Black-headed Gulls' nests and eggs. The cry of this bird was quite different to that of the Common or Arctic Tern, being shorter, sharper, and stronger. The old birds were

very bold, and swooped quite close to my head while I was examining their nests.

COMMON TERN (*S. fluviatilis*); ARCTIC TERN (*S. macrura*).—Both these Terns were breeding on Walney Island and at Ravenglass. I found them most difficult to distinguish from each other, and of course when they were flying overhead in numbers, even although one thought to distinguish individual birds, it was quite impossible to tell which eggs belonged to them.

The Terns' nests on Walney Island were in close proximity to those of the Black-headed Gull, some being in the sand-hills, and some on the marsh, or "moss"; but there were a few small colonies in secluded spots of turf and shingle, quite separated from the large colonies. The Terns' nests at Ravenglass, except the Sandwich Terns, were on a stretch of dry grassy land at the foot of the sand-hills, and some distance from the Black-headed Gulls. I found that the nests which were made on the sand generally had a tolerably thick pad of coarse grass as a lining (there is a quantity of coarse grass growing on the sand-hills both on Walney Island and at Ravenglass, of which the dead blades seem to be found a useful article by the Terns and Gulls), the hollow thus lined measuring about 4 in. diameter by $\frac{1}{2}$ – $\frac{3}{4}$ in. deep. Most of the nests made on the shingle had no lining at all, the nest-hollow being of about the same dimensions. The nests made on the short turf exhibited rather deeper hollows, with sometimes the lining of a few blades of the surrounding grass, but as often no lining at all.

I came upon two small outlying colonies, consisting of about half-a-dozen pairs of birds, in different parts of Walney Island, and spent some time watching them with my glasses until I satisfied myself that all the Terns breeding in these two spots were Arctic Terns. One of the small colonies was on a stretch of short turf close to the sea-front, and the other was on a small patch of shingle about one hundred yards inland. I examined four nests of those on the grass, and found them to contain two and three eggs, the nest-hollows being generally as already described. The eggs of one clutch which I took measured 1.6 in. by 1.15 in. In the colony on the patch of shingle I examined three nests, two of which contained three eggs, the other only two.

One of the nests containing three eggs had also a stone about the size of an egg placed in the middle of it. A clutch of three averaged 1·61 in. by 1·16 in.; but measurements of two isolated clutches are not much on which to base arguments. I did not notice any nestling Terns.

LESSER TERN (*S. minuta*).—*Walney Island*. I found one colony of these birds on a part of the beach. I examined two nests containing two and three eggs respectively. Both nests were on the shingle, just above high-water line; and the clutch of two eggs was amongst some large pebbles, really only just lying in the depression caused by the shape of the stones, without any attempt at scratching out a hollow. There was no kind of lining in either case, the eggs being laid on the bare stones.

Ravenglass. Here there was also a colony of Lesser Terns breeding on a shingly piece of beach to the north of the estuary of the Esk. I did not search for nests, but I accidentally found a single egg laid on the pebbles in a small hollow just above high-water mark.

I saw no nestlings of this species.

BLACK-HEADED GULL (*Larus ridibundus*).—*Walney Island*. There are large colonies of these birds at each end of the island, both on the sand-hills and on the moss. The coarse grass growing on the sand-hills forms little ridges and steps on the sides of the hummocks, and make a favourite resting-place for the Gulls' nests, which are thus built, as it were, in terraces. The dead blades of the grass give the bulk of the building material that the birds require, and with it they make, as a rule, a fairly substantial but shallow cup-shaped nest, resting directly on the sand. Amongst the colonies on the moss there will often be nests with a considerable foundation of rubbish and dead sticks, varying from a few inches to a foot in height. The biggest I noticed measured fully two feet across the base, and was a good twelve inches high. The rule with the nests on the moss was to have a foundation of sticks under the cup of grass, while the method in the sand-hills was for the cup of grass to be laid right on the sand without any materials underneath it. The inside measurements of the nests varied from 6-7 in. diameter by 1½-2 in. deep. Most of them had clutches of three eggs.

There were fresh eggs, eggs in all states of incubation, and also young birds to be seen, sometimes running about, but more generally skulking under the grass. The down of the nestlings is a sandy brown colour, with yellowish streaks and mottlings, and they have the beaks black and the feet flesh-coloured. I found one clutch of abnormally coloured eggs—a very pale washed-out blue, with a few faint brown smudges on them, and one or two thin streaks almost black in colour. Standing over, and looking at them as they lay in the nest, they had the appearance of being pale blue eggs without any markings, and were of course most conspicuous.

The old birds make a considerable noise as one walks through their nests.—About ten feet or so overhead fly a crowd of the Gulls, continually chattering, and occasionally swooping downwards at the intruder. Flying at a higher level are the Terns, also uttering all the time their long-drawn cries; and as an occasional Oystercatcher is disturbed, it will fly rapidly round, continually repeating its shrill whistle. The whole place is pervaded by a faint smell somewhat resembling a fowl-house. Visiting a large colony like this is of course full of interest to an ornithologist, but at the same time it rather gives him a feeling of surfeit, and is not to be compared for a moment to the satisfaction and pleasure to be derived from finding an isolated Ringed Plover's nest, after having exercised the patience necessary to watch the old bird on to its eggs.

Ravenglass. Except that all the nests here were situated among the sand-hills, the description of the colonies on Walney Island will do equally well for those at Ravenglass. There are, I should say, rather a larger number of Gulls at Ravenglass, and the process of incubation seemed there to be rather more forward. I caught a young bird in this colony which had strong quill-feathers in its wings, and could almost raise itself off the ground as it fluttered along. All the young birds I handled, at both places, were in capital condition, their bodies being almost round. They looked decidedly ludicrous when running (which they could do well, with a rather waddling action), especially if you got them silhouetted against the sky-line, when they appeared as a round ball with a neck stretched out in front, and two legs moving at top speed underneath. There was nothing whatever

in the picture to remind one of their elegant, and almost slim, parents flying overhead.

Boot. I was astonished at the number of these Gulls to be seen round Boot, mostly scattered about the pasture lands in the valleys, but often also right out on the moors. Their chief occupation seemed to be a search for food, and it was interesting to watch them beating slowly backwards and forwards over the meadows, hunting like a Dog, and now and again dropping on to the ground to pick something up. I was rather inclined to conclude that these birds were non-breeders, and had no connection with the colony at Ravenglass.

Arnside. There were very few Black-headed Gulls to be seen here.

HERRING-GULL (*L. argentatus*).—I saw a few of these Gulls round Walney Island. The bigger Gulls obtain no encouragement from their smaller relatives to frequent any of the colonies. I saw an immature bird, either this species or a Lesser Black-backed, being chased by a mixed mob of Black-headed Gulls and Terns, who gave it a very rough time indeed, until they had driven it out of their own sphere of influence.

I have seen it stated that these birds are to be found breeding on Foulshaw Moss, but I could not find any myself, and the keepers told me that there had been none breeding there for some years.

LESSER BLACK-BACKED GULL (*L. fuscus*).—I saw a few birds of this species round Walney Island.

Arnside. This Gull is here very numerous round the coast, most of those seen being, no doubt, members of the colony on Foulshaw Moss. Foulshaw Moss is rather an interesting stretch of country to visit for the first time. It is a considerable extent of perfectly flat low-lying land, which has evidently at one time been very wet and boggy, but is now intersected by ditches and drains cut into the peaty soil, which must carry off much of the superfluous moisture. I have no doubt, however, that in a wet winter it is still very soft. A great part of the ground is covered by a thick growth of heather, and some other small shrubs which I did not know, while running all through the heather is a thick undergrowth of long moss. There are other stretches of ground overgrown with thick tussocky grass, and

in various directions there are belts, and thin patches of small stunted trees and bushes from six to fifteen feet high. This has somewhat the effect of dividing the whole tract into separate open plains, each of which would be dotted over with single small trees or bushes, quite a number of which I noticed to be dead and bare of leaves. Over this area are scattered the Lesser Black-backed Gulls' nests. They are not by any means placed close together, the distance between the nests averaging from forty to fifty yards. As there are a great number of birds, the area covered by their nests is considerable. I found most of the eggs were hatched out, and there were many of the young ones skulking about in the undergrowth. The colour of the down of these was a sandy yellow with black mottlings, the bill black with a white tip, and the legs and feet lead colour. The down of a bird only just out of the egg was *grey* with black mottlings, which points to a possibility of the colour of the down altering as the age of the bird increases. I examined many nests, which, although tolerably easy to find, required to be looked for. The keeper who was with me found them so rapidly that I scarcely had time to find any myself. He told me that what he looked out for as he walked through the heather was the white downy feathers of the old birds stuck on the heather-bushes. In most cases there were one or more runs or passages up to the nest itself, and, as the bird passes through these, it leaves odd feathers hanging on twigs and branches, and by the quantity of feathers around the nest you can form a rough idea as to the state of the incubation of the eggs. There were a few nests with two eggs, but the majority had three in them. All that I blew contained fully-formed chickens, and the keeper told me that there were birds laying as early as the beginning of April. At the same time none of the young birds I saw were able to make any attempt at flight. There was a considerable similarity in the construction of the nests, which showed signs of much more care than in those of the Black-headed Gull, the material forming them being almost felted together into concave pads, the hollows measuring roughly 9 to 10 in. diameter, by $1\frac{1}{2}$ to $2\frac{1}{2}$ in. deep. One nest I examined was placed between some big tussocks of coarse grass, the materials used for the pad being moss, grass-blades, small twigs, and a few

white feathers, which made a thick and soft bed for the eggs. The shallow cup measured 9 in. diameter, by $2\frac{1}{2}$ in. deep. While I was looking at this nest the old bird was making very vigorous swoops unpleasantly close to my head, uttering an angry cry each time it descended. Another nest, which was placed on bare ground in one of the clumps of small bushes and trees, was made of moss, twigs, and dead leaves, formed into a fairly solid mass, which measured at the base 15 in. diameter, the cup being the same dimensions as the other one, the top edge of the rim of the cup 5 in. high from the ground. The nests amongst the heather were much the same as those already described. In several places I noticed heaps of a small pink bivalve shell.

GUILLEMOT (*Uria troile*).—I found a dead body of a Guillemot on the beach at Walney Island.

BIRDS COLLECTED AND OBSERVED IN THE
DARBHANGA DISTRICT, TIRHOOT, BENGAL.

BY GORDON DALGLIESH.

(Continued from p. 215.)

Crocopus phænicopterus, Lath. (Bengal Green Pigeon).—Very common. Breeds in April, May, and June. These Pigeons are, as a rule, gregarious, and go about in enormous flocks.

Columba intermedia, Strickl. (Indian Blue Rock-Pigeon).—Very common about old buildings and ruins. They breed throughout the year.

C. livia, Gmel. (Blue Rock-Pigeon).—One out of a pair was shot at Dalsingh Serai in June, 1900. It was unfortunately too badly hit to preserve.

C. eversmanni, Bonap. (Eastern Stock-Pigeon).—Occasionally seen during the cold weather.

Turtur ferrago, Eversm. (Indian Turtle-Dove).—An uncommon winter migrant.

T. suratensis, Gmel. (Spotted Dove).—Very common. Breeds throughout the year. It lays two eggs, very seldom three.

T. risorius, Linn. (Collared Turtle-Dove).—Quite as common as the last. Breeds throughout the year. At Hattowrie Factory, Darbhanga, in May, 1901, I saw a Dove which I take to be a hybrid between this species and *T. suratensis*. The Dove was quite close to me feeding on the ground. The wings and upper plumage were that of *T. suratensis*, the breast was like that of *T. risorius*, and it had a distinct black collar. In size it was intermediate between the two forms.

Enopopelia tranquebarica, Herm. (Red Turtle-Dove).—This beautiful little Dove is the rarest species to be found. I have only twice come across their nest.

Excalfactoria chinensis, Linn. (Blue-breasted Quail).—I once saw a small Quail which I took to be this species at Dalsingh Serai

Mr. Inglis records having seen another at Hattowrie Factory, Darbhanga.

Coturnix communis, Bonn. (Common Quail). — Common in February and March, though the year (1901) was remarkable for its scarcity of Quail. I never saw a single specimen, neither were any brought me by native fowlers. Some are probably resident. Mr. Inglis procured one egg laid by a captive bird.

C. coromandelica, Gmel. (Black-breasted Quail). — Two eggs of this species taken in September by Mr. Rawlins, of this district, and sent to me. Several birds of this species were shot at Dalsingh Serai, so I have been informed, many years ago.

Francolinus vulgaris, Steph. (Black Partridge). — Usually one or more pairs are to be found in any grass jungle during the cold weather, but in summer they scatter, and are found among crops. They are the best birds I know at running, and are very difficult to flush, reminding one of the English Corn-Crake in this respect. They are very fair eating if hung for a day or two. One bird I shot had a number of large black ants in the crop.

F. pondicerianus, Gmel. (Grey Partridge). — A rather scarce bird, and I have only shot it twice.

Turnix dussumieri, Temm. (Little Button-Quail). — Mr. Inglis informs me that he had a pair of this species snared at Jainagar.

T. tanki, Blyth (Indian Button-Quail). — Not often seen, probably on account of its shy skulking nature.

Porzana pusilla (Eastern Ballion's Crake). — A male of this species was snared by native fowlers at Hurnella Jheel, Darbhanga, and brought to Mr. Inglis, who afterwards gave me the skin.

Rallus aquaticus, Linn. (Common Water-Rail). — One specimen (a male) was shot by me at Hattowrie Factory, Darbhanga, on Feb. 12th, 1898. The only other places where this bird has been recorded from India are Gilgit (Scully), Kulu (Hay), and Dera Dun (Hume). Mr. R. George killed a specimen near Skikarpur ('Fauna of Brit. Ind., Birds,' vol. iv. p. 160). One (a female) procured by Mr. Jesse at Lucknow was recorded in the 'Field.'

R. indicus (Indian Water-Rail). — A Rail, which I think

was this species, was seen by me on a small pond near Bunhar Factory, Samastipur, in February, 1899. I fired at it, but it was only wounded, and escaped by diving; and, though I had men searching for a long time, they failed to find it.

Amaurornis phoenicurus, Penn. (White-breasted Water-hen).—Very common. Found by nearly every piece of water. It is an exceedingly noisy bird, and its loud harsh cry is heard both day and night. In the year 1900 I was stopping at a house, the garden of which was inhabited by a pair of these birds, which kept me awake most of the night by their cries. They breed during July and August, making a nest of rushes, placed as a rule, near water. They are very pugnacious birds, and I have often seen them fighting furiously with each other; a pair were so engaged on one occasion, that I approached to within a few yards of them before they were aware of my presence.

Gallinula chloropus, Linn. (Moorhen). — Common. Breeds in August.

Porphyrio poliocephalus, Lath. (Purple Moorhen).—Fairly common. It breeds during July and August in marshes and rice-fields. The nest is a huge mass of rushes or rice placed on water.

Fulica atra, Linn. (Coot).—Very common during winter, and a few remain to breed.

Grus antigone, Linn. (Sarus Crane).—Occasionally seen during the cold weather.

G. communis, Linn. (Common Crane). — Once seen near Hattowrie Factory, Darbhanga, in December, 1897.

Anthropoides virgo, Linn. (Demoiselle Crane).—A not very common cold weather migrant. Often heard at night as they fly to their feeding-grounds.

Sypheotis bengalensis, Gmel. (Bengal Florican).—I only saw one specimen, which was flushed from some heavy grass jungle.

Edicnemus scolopax, Gmel. (Stone-Curlew).—Very common. Breeds, according to Mr. Inglis, in April.

Esacus recurvirostris, Cuv. (Great Stone-Curlew).—One seen by Mr. Inglis on the banks of the Kamla, and one shot by me at Hattowrie Factory, Darbhanga.

Cursorius coromandelicus, Gmel. (Indian Courser). — Very common in some parts during winter. They run very swiftly, and their flight resembles that of the Lapwing. They are excellent birds for the table.

Glareola lactea, Temm. (Small Indian Pratincole). — I have a pair of these birds given me by Mr. Inglis. I have never come across any myself.

Metopidius indicus, Lath. (Bronze-winged Jacana). — Not uncommon. They breed in weedy tanks in July and August.

Hydrophasianus chirurgus, Scop. (Pheasant-tailed Jacana). — Very common on all marshes. It breeds in July and August, and sometimes in September. They lay from three to four eggs. The cry of this bird resembles the "mewing" of a cat.

Sarcogrammus indicus, Bodd. (Red-wattled Lapwing). — Very common. Breeds from March to May. They are noisy birds, and are well known on account of their cry, which resembles the words "did he do it."

Sarciophorus malabaricus, Bodd. (Yellow-wattled Lapwing). — A rather scarce bird. I have not often seen it.

Hoplopterus ventralis, Wagl. (Indian Spur-winged Plover). — Very common on the banks of rivers. A nest found by Mr. Inglis's collectors in May contained two eggs.

Charadrius fulvus, Gmel. (Eastern Golden Plover). — Very common in some parts in winter. They are extremely wild birds, and difficult to approach.

Ægialitis mongolica, Pall. (Lesser Sand-Plover). — Common on ploughed lands, and on the banks of rivers.

Æ. alexandrina, Linn. (Kentish Plover). — A common cold weather migrant. A specimen shot by one of Mr. Inglis's collectors in April was in full breeding plumage.

Æ. dubia, Scop. (Little Ringed Plover). — Common on the banks of large rivers.

Himantopus candidus, Bonn. (Black-winged Stilt). — A common winter migrant.

Recurvirostra avocetta, Linn. (Avocet). — Rare. One brought to me by a native fowler in February, 1900.

Numenius arquata, Linn. (Curlew). — I shot one pair in February, 1900, and saw a few others.

Limosa belgica, Gmel. (Black-tailed Godwit). — Several seen

at Dalsingh Serai in February, 1900. They were feeding in an enormous flock. Thirteen birds were the result of one shot fired.

Totanus hypoleucus, Linn. (Common Sandpiper).—Very common in the cold weather by nearly every piece of water.

T. glareola, Gmel. (Wood Sandpiper).—Very common from August to March.

T. ochropus, Linn. (Green Sandpiper).—More abundant than *T. glareola*.

T. stagnatilis, Bechst. (Little Greenshank).—Very rare. I only got one specimen.

T. glottis, Linn. (Greenshank).—Abundant during the cold weather.

T. fuscus, Linn. (Spotted Redshank).—A common cold weather migrant, arriving in October.

Pavoncella pugnax, Linn. (Ruff and Reeve).—Rare. I have a pair in my collection, given me by Mr. Inglis.

Tringa temmincki, Leisl. (White-tailed Stint).—Very common in the cold weather, in large flocks.

T. minuta, Leisl. (Little Stint).—Not quite as common as the last.

T. alpina, Linn. (Dunlin).—A male was shot by me in February, 1898. It was the only one secured out of a small flock.

Gallinago cœlestis, Frenz. (Common Snipe).—Very common from September to April.

G. sternura (Pin-tail Snipe).—Several shot near Darbhanga in December, 1900.

G. gallinula, Linn. (Jack-Snipe).—I shot several of this species in January and February, 1900.

Rostratula capensis, Linn. (Painted Snipe).—I only got one specimen in four years.

Larus ichthyaëtus (Great Black-headed Gull).—I saw this bird twice, but was unable to shoot it.

L. brunneicephalus (Brown-headed Gull).—Mr. Inglis obtained one specimen of this bird in the district.

Hydrochelidon hybrida, Pall. (Whiskered Tern).—A common resident. Mr. Inglis found a colony of these birds breeding, and gave a very interesting account of it in the Bombay Natural History Society's Journal.

H. leucoptera, Meisn. & Schinz. (White-winged Black Tern). I shot a bird which I identified as this species, but unfortunately lost the skin.

Hydroprogne caspia, Pall. (Caspian Tern). — I once saw a number of these birds, but was unable to procure any.

Sterna seena, Sykes (Indian River Tern). — A very common resident.

S. anglica, Mont. (Gull-billed Tern). — I have on two or three occasions seen this species.

S. melanogaster, Temm. (Black-bellied Tern). — A common resident.

Rhynchops albigollis, Swains. (Indian Skimmer). — Not uncommon on large rivers.

Pelecanus philippensis, Gmel. (Spotted-billed Pelican). — Fairly common during the monsoon.

P. roseus, Gmel. (Eastern Pelican). — Mr. Inglis procured one specimen of this bird.

Phalacrocorax carbo, Linn. (Great Cormorant). — I only got one pair of these birds.

P. javanicus, Horsf. (Little Cormorant). — Very common on all large pieces of water, and in one place I counted some hundred, all fishing together.

Plotus melanogaster, Penn. (Indian Darter). — One was seen near Jhangaipur.

Ibis melanocephala, Lath. (White Ibis). — Not very common, though I have seen large numbers occasionally in the cold weather.

(To be continued.)

NOTES AND QUERIES.

MAMMALIA.

White-beaked Dolphin at Great Yarmouth. — A White-beaked Dolphin (*Delphinus albirostris*), 54 in. in length, was brought in on July 12th; it was taken in the nets of a herring-lugger the night previous. With the great increase of steam drifters cetaceans appear to have become comparatively scarce. — A. PATTERSON (Ibis House, Great Yarmouth).

AVES.

Notes from Yarmouth. — Bird-life in this locality during the past dreary summer and autumn has not presented many interesting episodes. My month's holiday on Breydon mud-flats in July and August afforded as blank a record as any I ever remember.

A late Oystercatcher (*Hematopus ostralegus*) flew past me on Breydon on the night of June 20th; and up to June 25th I never saw fewer Redshanks (*Totanus calidris*), which nevertheless had a good time in the upper marsh-lands, for they were reported numerous on the Beccles river, and in August were around my location on the flats in exceedingly gratifying numbers. I suspected them of feeding on *Corophium longicorne*, a species abounding in the surface of the ooze, and on small red mudworms beneath it. Lesser Terns were familiar objects in May and June, the smart little fellows fishing all around one, as if man had never an evil thought, and they were attracted still closer by an imitation of their note. Two pairs would, I believe, have nested with us on a flat they took a fancy to; they roosted on somewhat dry spots. There at night, right through May, they fished in its vicinity, and when it was too rough, angled in the semi-brackish ditches for Three-spined Sticklebacks, and even seemed to prefer fishing there when the Herring-Syle appeared in the tidal water. I had more than one happy moment watching them dropping upon their prey as I skulked in the grass at a ditch-end. They seldom missed a "stoop." But their household anticipations were suddenly overthrown by the incoming of rather full spring tides, which washed them and their prospects off the flat together. Nevertheless, some were seen about until June 27th. As early as July 7th several came

back again from a spot best not localised. On Aug. 21st the old birds capturing juvenile Herrings for their young was a most interesting observation, while the eager and fussy solicitations of the young Terns were charming. They followed their parents awing, preferring to drop on to the surface of the water to receive their dole. Two or three score used Breydon up to the end of August, when, alas! some guns arrived to break up these happy family parties. If men would only learn how much more delightful and bewitching it is to look down the inside of a field-glass than to squint down a gun-barrel, what greater happiness would obtain to all parties concerned! A Caspian Tern (*Sterna caspia*) turned up on July 24th, and a young Black-headed Gull (*Larus ridibundus*) on July 2nd. Two Cuckoos were piping early on the morning of July 3rd. One gave the cry in the natural key; the other more shrilly, and half a tone higher; and, curiously enough, unaided by an echo, piped "cuck-cuck-oo!" I never heard this cry before; have any of your readers? I had ample opportunity for hearing many a repetition of it.

The Heron is a bit of a wag in his way. One, having satisfied the cravings of hunger, amused himself catching such little Eels and Flounders as came near his submerged feet, letting them go again—probably with a caution! Imitating the cry of a passing youngster, in the dusk on Aug. 4th, I decoyed him to within a very short distance of my head. Greenshanks were fairly numerous "on call" during August. Knots, Turnstones, Curlew-Sandpipers, in some numbers too—the Knots so tame that a couple I passed and repassed would not flit from a bit of floating wood they were resting on until forced to fly by water repeatedly splashed on to them by my oar; they seemed to wonder, as I did, what business of mine it was to interfere. Only one Spoonbill was observed on Breydon this year, which, being innocent enough to wander to the marshes, was shot. — A. PATTERSON (Ibis House, Great Yarmouth).

Wood-Sandpiper in the Orkney Islands.—I think perhaps it may be of interest to record the occurrence of the Wood-Sandpiper (*Totanus glareola*) in the Orkney Islands. A friend of mine shot one in my presence on the island of Eday on Sept. 1st. It rose out of a Snipe-bog, and at the moment of firing he took it for a Snipe; but, on examining it, we soon identified it as a Wood-Sandpiper. Both Wood and Harting say that the bird is rare in Scotland, so perhaps this note may be worth printing. The bird was tame, but it had an even more erratic flight than the Snipe. — C. S. BUXTON (Newtimber Place, Hassocks).

PISCES.

Notes from Yarmouth.—Several Cuckoo Rays (*Raia miraletus*) were brought into Yarmouth in April. An enormous Haddock (*Gadus aeglefinus*)—length 2 ft. 9 in., weight $10\frac{1}{2}$ lb. when “gutted”—was landed at about the same time. Early in the summer an Eckstrom's Topknot (*Zeugopterus unimaculatus*) was captured in a shrimp-net off Yarmouth. Length, $5\frac{1}{2}$ in. This is new to the fauna of this district. The fish was saved for my inspection, but was unfortunately too dry for proper preservation.—A. PATTERSON (Ibis House, Great Yarmouth).

INSECTA.

Making the best of Difficulties.—A curious instance of making the best of difficulties in insect-life came to my knowledge a few days ago. A young lad had made for himself a breeding-cage for larvæ, the bottom, or tray, being of stout brown-paper board, and the four sides and the top covered with gauze, which was supported by a straight stick, some eight or nine inches high, at each corner. These uprights were about the thickness of a lead-pencil, or possibly a trifle more. Into this cage he put some larvæ of *Dicranura vinula*. Two of the larvæ made their cocoons on the face of these corner sticks, which did not offer a surface of more than a quarter of an inch. One larva escaped into the room, and was afterwards found to have made its cocoon on the leg of an oak chair, or stool, I forget which. I think both these expedients are worth notice. — W. OXENDEN HAMMOND (St. Albans Court, near Dover).

[The above experience is not uncommon. In ‘The Zoologist’ (1863, p. 8785) there is a record of these larvæ “forming their cocoons upon those of their predecessors.” In one corner of a box there were no fewer than six clustered together.—ED.]

ANIMAL SENSE PERCEPTIONS.

By this mail I am sending two specimens (male and female) of a bug which was too common in every garden in Johannesburg last summer, and which is doubtless well known to you.* In ‘The Zoologist’ (*ante*, p. 161) is an interesting article by Mr. Distant, under the heading “Biological Suggestions.” As bearing on the question of the protection afforded to insects by nauseous smells, the following facts may be of interest:—The bug referred to above

* *Holopterna alata*, Westw., belonging to the Fam. *Coreidæ*.—ED.

is possibly a recent introduction here,* as it has lately appeared in enormous numbers, especially during the war period, when most people were absent from their houses and gardens in Johannesburg. It is a rather large insect, and from the damage it does to many plants, including dahlias, roses, salvias, wistarias, the young shoots of Japanese privet, and even of almond and apricot trees, it readily attracts attention. Like so many of its kind, it is possessed of a most unpleasant smell—a smell of a nastiness and penetration surpassing that possessed by any other insect I am acquainted with. Moreover, it has the power, which it seldom neglects to use when opportunity offers, of squirting out, apparently with some accuracy of aim, a most offensive and disgusting fluid, which appears to be the source of the unpleasant smell referred to.

In spite of its size this insect is not readily seen unless looked for. Its angular outline and general colouration are distinctly protective, and, although strong on the wing, it has the habit, like some other protectively coloured insects, of letting go its hold of a plant, and dropping to the ground, where it lies perfectly still in whatever position it has fallen. It is then very difficult to distinguish among dead leaves, twigs, and pebbles. From its extremely offensive smell, and its abundance in every garden, I was inclined to infer that it must be unpalatable to ordinary enemies of insects. I noticed, however, that a Lizard (*Eremias* sp.), of which there were many in my garden, greedily ate some of the bugs I had killed; another Lizard (*Agama* sp.) declined the dainty morsel, preferring to rapidly pick up the ants which had commenced swarming round the dead bugs. Afterwards I found that my fowls were very eager after the bugs, and seemed to find them very much to their liking. My next-door neighbour had for some time a tame Meerkat (*Suricata tetradactyla*), a little animal possessed of the keenest sense of smell, and it also readily ate these bugs.

The fact that this bug is eaten by various creatures is, of course, what one might expect from a knowledge of its habits and colouration. It is very probable that its disgusting smell does afford it a certain amount of protection from enemies—indeed, it would be hard to account for such highly developed offensiveness except on some such ground of utility; but it is clearly a case where, to quote Mr. Distant's words, odoriferous protection proves of a "highly partial and uncertain character."—HAROLD FRY (Rock House, Johannesburg).

* A common Transvaal insect, which I always found about Pretoria.—Ed.

REFERRING to the Editor's article on "Animal Sense Perceptions," I kept a Skunk for a pet six or seven years ago which followed me about like a Dog. At first I had to put up a good deal with the smell, but as it grew tame it was only upon great excitement that it emitted this odour, and this did not seem to be so durable as described in some of the quotations in that paper.

Here the natives do not teach the calves to drink out of a bucket, so that they imbibe direct from the cow. When the native milks the cow the calf must be beside him, otherwise the cow could not be so easily milked. If the calf dies, it is skinned and stuffed with straw, and in a rough fashion made lifelike. This stuffed skin is placed beside the boy while milking, so that the cow can smell it, and thus have no objection to the process. Here smell is stronger than sight.—KENNETH J. CAMERON (Namasi, Zomba, British Central Africa).

MIMICRY.

THIS natural phenomenon has, according to Dr. Andrew Wilson, recently received a very novel application in connection with certain gunnery experiments made at Aldershot. "The red coat of the British soldier has long been condemned as a mark for the enemy; hence khaki and greys have come into favour as colours for the protection of the soldier. At Aldershot the experiments were carried out on guns and their limbers, by way of securing concealment when placed against a variety of backgrounds. Six guns were painted red, blue, and yellow. Seen from a distance, the colour-blending rendered them practically invisible. At a distance of 800 yards it is said the outlines of the guns disappear. At 1000 yards they become lost to sight, and their location is impossible. This experiment is strongly suggestive of the Tiger markings, apparently most conspicuous, but harmonising so thoroughly with the surroundings that all trace of the animal is lost."—ED.

NOTICES OF NEW BOOKS.

Ootheca Wolleyana : an Illustrated Catalogue of the Collection of Birds' Eggs formed by the late John Wolley, Jun., M.A., F.Z.S. Edited from the original notes by ALFRED NEWTON. Part II. *Picariæ-Passerres.* R. H. Porter.

THE first part of this publication was reviewed in 'The Zoologist' for 1865! Since then another generation of ornithologists has arisen; but we may well, in more senses than one, congratulate Prof. Newton and ourselves that he is still the spirit of the work. In his preface we are given many reasons why the delay has been unavoidable, and in some respects beneficial to the production of this instalment; and we read with intense satisfaction, which will doubtless be shared by most naturalists, some wise words on classification. Classifications are always more or less propositions, and Prof. Newton remarks:—"The ideal Taxonomy of Birds is beyond the range of my vision. All that is wanted in the present case is care not to break up groups which are believed to be most nearly allied; their sequence signifies little, and in the existing condition of systematic ornithology—if such a phrase be allowable—the most ready way of referring to any species is to look for its name in an Alphabetical Index." We are glad these words bear the impress of his authority.

We are here given an interesting memoir of John Wolley, who, like many more, did much, though he died early. The memoir also observes the real obituary canon. In the record of every life there are facts we want to know; things we ought to know; but other matters of which we ought not to be told. A biography is not an autopsy, or at least should not be.

There are lessons we may find in the notes. How often and how readily mistaken identity is recorded! Wolley relates an instance in connection with the eggs of a Woodpecker: "I

looked at the bird with my glass, and, alas ! satisfied myself (!) that it was *Picus tridactylus* ; but the moment I saw the beautiful eggs brought to daylight I suspected an error, and went back to the boat to fetch my gun, and shot the bird. It turned out to be, as I anticipated, *P. minor*." Even now we can read with enthusiasm the facts as to the breeding habits of the Waxwing (*Ampelis garrulus*), which Wolley was the first to master and describe; while we are told that up to the time of his departure for Lapland in 1853 considerable uncertainty remained as to the colouration of the Redwing's egg.

It will interest aviculturists to learn that the same observer noticed in a wild Snow-Bunting (*Plectrophanes nivalis*) that "she was suffering badly from a distressing complaint, well known to those who keep birds in confinement as 'asthma.'"

References also recur to some well-known names of those now with us no more. We read of Salvin, and he is gone. Hewitson also is mentioned as a good oologist, and it is probable that his reputation as such will outlast his notoriety as a famous butterfly collector and iconographer, a pursuit which occupied all the last years of his life. Altogether the notes in this volume constitute sufficient material for a whole series of modern books on birds, and, the editing being done by Prof. Newton, the records require no further elucidation. There are four coloured plates of eggs, four plates depicting boreal scenes, a portrait of Wolley, and one of L. M. Knoblock, who seems to have been a conscientious professional collector, with a first-hand knowledge of birds.

Zoological Results, based on Material from New Britain, New Guinea, Loyalty Islands, and elsewhere, collected during the Years 1895-97 by ARTHUR WILLEY, D.Sc. Lond., &c.
Part VI. Cambridge : at the University Press.

THIS part is the concluding publication detailing the results obtained by a memorable expedition; for when the Managers of the Balfour Studentship in the University of Cambridge can despatch an expedition with the avowed object of procuring material for the study of the embryonic development of the Pearly Nautilus, we may safely realize that the real biological

spirit of zoology is not neglected, and that the results of a truly scientific expedition like this one will be remembered when many highly boomed excursions, promoted by wealth and designed for sport, will have been mercifully forgotten.

In this part Dr. Willey gives an interesting personal narrative of his travels, and a special contribution on the subject which was the primary object of the expedition. The Pearly Nautilus is of consummate interest to zoologists. It constitutes one of the "persistent types" that has travelled on practically unchanged from pre-tertiary ages; it possesses an earthly—or marine—tabernacle, perfected probably before the evolution of our own; and of its complete embryonic development we are even now not fully informed. But Dr. Willey has brought this subject within measurable distance of a final determination, and has written the memoir on this animal which is the last for present consultation. As regards the morphology of the structure of Nautilus, our author inclines to an epipodial theory; but here our function terminates, and we must refer the reader to the Memoir itself, which is embellished with nine beautiful plates, beside other textual illustrations.

Our Country's Fishes, and how to know them; a Guide to all the Fishes of Great Britain. By W. J. GORDON. Simpkin, Marshall, Hamilton, Kent & Co., Limited.

THOSE to whom the volumes of Couch, Yarrell, and Day are inaccessible, and who are desirous of a cheap guide to the discrimination of British Fishes, will find this volume a boon. Of course it is a compilation, and made by one who will probably not claim to be a specialist on the subject; but if its aim is clearly understood, and its figures rather than its text be its principal recognition, then the publication will supply a want, and should ensure a very considerable circulation. The plates also are a distinct improvement on those in other publications of the series, and in some instances are successful in portraying the difficult colour-markings of fishes. In Chapter IX., "Genera and Species," will be found a considerable collection of biological and other facts, but we wish that space would have allowed of reference being made to the sources from which they

were derived. In all branches of knowledge authority for statements is indispensable; we want to discriminate between the accepted observer and the accomplished purveyor.

A Glossary of Popular, Local, and Old-fashioned Names of British Birds. By CHAS. LOUIS HETT. Henry Sotheran & Co.

IN our volume for 1899 (p. 190) we drew attention to a small volume written by Mr. Hett, entitled "A Dictionary of Bird Notes, to which is appended a Glossary of Popular, Local, and Old-fashioned Synonyms of British Birds." So useful was this glossary found by all alike that Mr. Hett has now republished the same, very much enlarged, and nearly including 3000 names; "or on an average of between seven and eight for each species." This is a most welcome publication, but we wish that it had been issued in a more durable form, as a paper cover will certainly not survive the constant use to which it will be put.

The Early Life of the young Cuckoo. By W. PERCIVAL WESTELL. Thomas Burleigh.

THIS small brochure principally recounts the original observations made by Mr. John Craig, of Ayrshire, and contains reproductions of "four remarkable photographs taken direct from nature by J. Peat Millar."

EDITORIAL GLEANINGS.

SAN PETE COUNTY, Utah, offers a rich market for Grasshoppers, for, as the 'New York Times' observes, men, women, and children are engaged from daylight until dark in collecting the pests and shipping them to the cities. The market price is one dollar a bushel, and there seems to be no limit to either the supply or demand. Millions of the insects darken the sun and hover over the gardens and fields, threatening destruction to everything in their pathway. An area comprising 1,800 square miles, in the centre of the richest agricultural section of Utah, is infested by the Grasshoppers. Sections of soil under microscopic test show seventy-six Grasshopper eggs deposited in a piece only two inches square. This is the situation in an entire mountain-walled valley, including fifteen prosperous towns, having a combined population of 20,000 people. The insects are everywhere that they can crawl or fly, and have destroyed the wheat and oat fields, and will soon strip the grasses and trees of every sign of vegetation. The average daily harvest of men and women ranges about thirty bushels of the insects. These are held in "gunny sacks," and measured or guessed as to quantity, and the money paid without a murmur. Business men and farmers have contributed to a fund for the extermination of the Grasshoppers, and have all the people they can secure at work picking them from the grain fields. When a collection of sacks is made the mass is burned on the streets amid the shouts of young and old gathered about the bonfires.—*St. James's Gazette.*

THE little Scottish town of Cromarty has recently celebrated the centenary of the birth of Hugh Miller, son of a Cromarty fisherman, by early profession himself a stone-mason. The observation he had exercised as a stone-mason, and the attention which he had since devoted to geological studies, were embodied in 1841 in 'The Old Red Sandstone, or New Walks in an Old Field,' a book which may fairly be said to have made a deep impression in both the scientific and literary worlds. Written in a stately, lucid style, with vivid passages which proved an eye-to-eye acquaintance with his subject, its con-

clusions bore witness to the originality of its author's researches. The work was illustrated by drawings from his own hand. "The more I study the fishes of the 'Old Red,'" wrote Huxley twenty years after, "the more I am struck with the patience and sagacity manifested in Hugh Miller's researches, and by the natural insight, which in his case seems to have supplied the place of special anatomical knowledge."

In a centenary address, Sir A. Geikie remarked: "Hugh Miller's researches among the fishes of the Old Red Sandstone showed him to be a naturalist and palæontologist. It was Hugh Miller's 'Old Red Sandstone' that first revealed to him (Sir A. Geikie) the meaning in the commonest stones beneath his feet."

OUR contributor Mr. W. Ruskin Butterfield has recently communicated a letter to the 'Times' on the subject of "The Preservation of our rarer mammals." The following is an extract:—Certain of our native mammals are so rapidly approaching extinction that for some time it has been a matter of the gravest concern to those who are interested in their survival. Unfortunately, in seeking the attention of those to whom, directly or indirectly, the blame attaches, one labours under an obvious disadvantage. On estates where the production of large quantities of game is the "be-all and the end-all," any but a very sparing admixture of carnivorous mammals is out of the question. It by no means follows, however, that the total extirpation of these animals is necessary. I believe a small admixture to be not inconsistent with the best results. In dealing with vermin, game preservers too often lose sight of the zoological aspect of the question. There can be no doubt that carnivores play an important part in the economy of nature. When an admixture of animals (no matter of what class) is subjected to the rapacious attacks of other animals, the tendency must always be for the former to become more vigorous, since those individuals best able to withstand attack survive. I hope this point, which has been insisted upon by many naturalists, will have some weight in the right quarters.

BAVARIAN officers, experimenting with a balloon some 6,000 ft. aloft, noticed a little black speck which seemed to accompany them, and which they thought was one of the cards which they carry for throwing out reports, and that the dropping of the balloon drew it along, but on looking at the barometer they found the balloon was rising, and not dropping. Suddenly, however, a loud chirping showed that it was a Lark, which, flying at this extraordinary height, had been frightened by the balloon.—*Westminster Gazette*.

